MANAGEMENT PLAN FOR

RED ROCK CANYON OPEN SPACE

SEPTEMBER 2004

PREPARED BY:
THE ENVIRONMENTAL CLASS AT PIKES PEAK COMMUNITY COLLEGE
UNDER THE DIRECTION OF MARK PLATTEN,
WITH SERENA SOHN, KRYSTAL GAULEY, MIKE METTLACH,
NICK KEATING, AND MOLLY MCLAUGHLIN
AND THE CITY OF COLORADO SPRINGS
PARKS, RECREATION & CULTURAL SERVICES,
TOPS PROGRAM MANAGER, TERRY PUTMAN
AND TOPS ADMINISTRATOR, CHRISTIAN LIEBER

CONTENTS

FIGURES

SUMMARY

The ***Red Rock Canyon Open Space Master Plan*** was prepared in 2004 and this ***Management Plan*** is a companion plan to determine how to manage the open space as determined by the planning team with the assistance of students at Pikes Peak Community College under the direction of Mark Platten. The ***Plan*** is based on the best available information and provides a comprehensive assessment of existing conditions. It is a guideline for the protection of the resources present on the open space.

The ***Plan*** provides broad goals for accomplishing and guiding future decisions about resource protection and development. Some of the goals, objectives and recommended actions such as existing maintenance practices and others suggest a substantial change in the long-term direction and will require more specific site plans and design to implement.

This ***Plan*** is to be used as a guide to action in the immediate future, as well as over the long term. As with any working document, it should be updated and revised regularly as needed.

INTRODUCTION

Location

"In the heart of the Pikes Peak region of Colorado, bordered on the north by Colorado Avenue and the Garden of the Gods; on the west by Manitou Springs, Deer Mountain and Pikes Peak; on the south by Bear Creek Canyon and the Broadmoor country; and on the east by Colorado City, lies Red Rock Canyon." (Bock pg. 1) This 787-acre property is located in unincorporated El Paso County, Colorado, between Colorado Springs and Manitou Springs. The property is bounded on the north by U.S. highway 24, on the south by section 16 Open Space, on the west by the Crystal Hills neighborhood, and on the east by 26th Street.

Figure 1: Regional Setting Overview Map

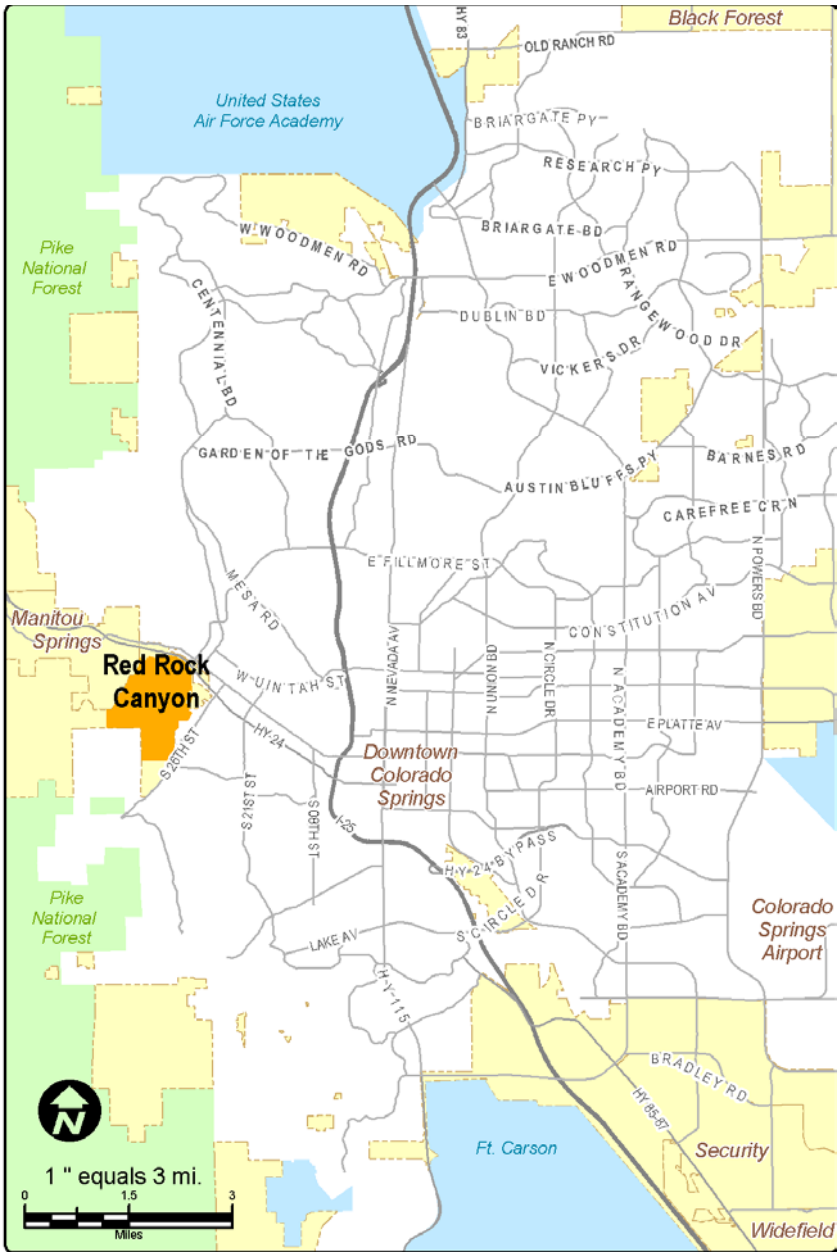
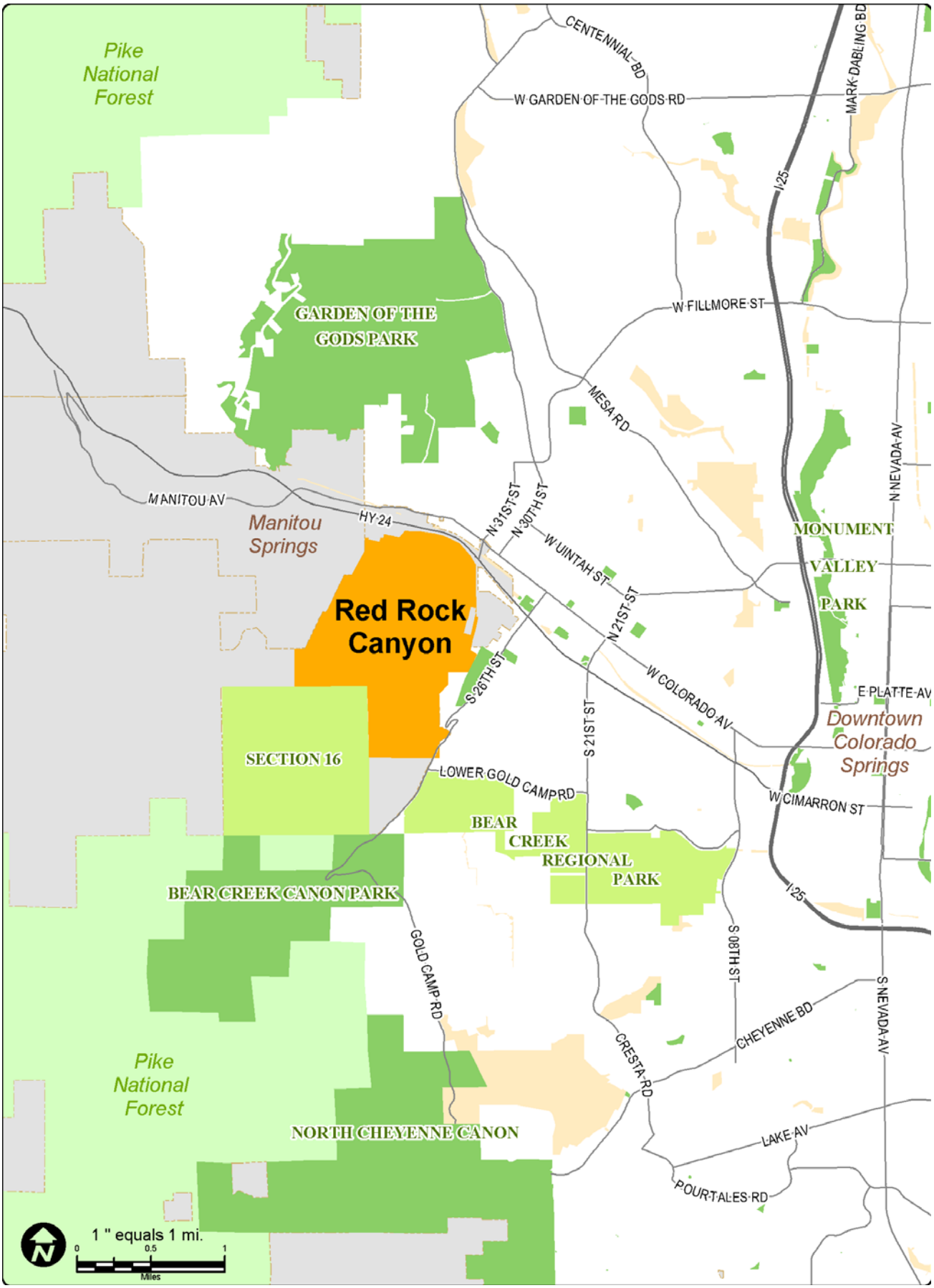


Figure 2: Local Setting Map



Background

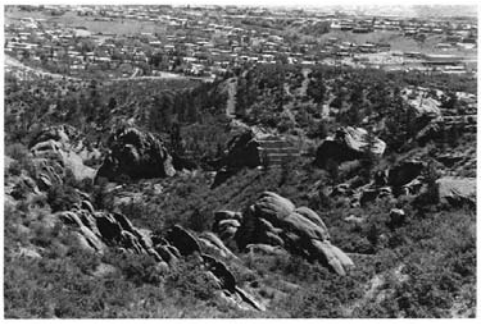
This property has played many historical roles throughout the development of Colorado Springs. Back in the years of 1859 and 1860, Dakota sandstone was quarried and used in the Heisdick building. Over the next half of a century, the Bott and Langmeyer Building Stone Company developed a series of quarries that were scattered over a mile and a half of hogback. Dakota sandstone had the ability to be cleaved with basic tools and hauled into towns in wagons unlike the Lyons sandstone, which is also found on the property.

Samuel Patterson established a homestead claim in Gypsum Canyon, which is just west of the hogback. Gypsum was mined and hauled to town to make plaster. Anthony Bott also mined limestone just east of the quarries. Mr. Bott operated with the Langmeyers. He would ship the limestone to Denver to be made into cement until he built his own cement plant. Eventually this cement plant burned down and Mr. Bott went out of business. By 1880, the Lyons sandstone became popular so there was a demand for it. Lyons sandstone is monolithic and lacks convenient bedding planes along which it can be cleaved. To quarry this sandstone it required expensive steam powered machinery, channeling machines and drills. In 1886 the Midland Railroad built spurs to serve the quarries.

There were two large quarries on the Red Rock Canyon property: the Snider Quarry, which was operated by the Sniders of Manitou, and the Kenmuir Quarry, which was operated by the Greenlee Stone Company of Denver. In 1896, just east of Anthony Bott's stone quarry, the Colorado-Philadelphia Reduction Company built a mill for refining Cripple Creek Gold. By 1904 the demand for the stone declined and the quarries stop operating.

The land didn't have much happening on it for the next 19 years. In 1923, John George Bock moved to Colorado Springs. Mr. Bock operated the Roundup Stables just north of Red Rock Canyon (Ellis, West Word Pg.1-5). Over the following years Mr. Bock bought most of the private land in and around Red Rock Canyon, starting with 72 acres in Gypsum Canyon, which cost $3.00 an acre. He also bought 129 acres which had belonged to the Greenlee Stone Company for $1,300 and 45 acres that belong to the Earth Products Company for $500. An additional 40 acres that had once belonged to the Colorado Stone Company was purchased for $500. Two-hundred acres that

belonged to the Union Land and Cattle Company was purchased for $4000 and the final 87-acre Swope property was acquired for failure to pay back taxes. By 1938, Mr. Bock had acquired the Red Rock Canyon property through the series of aforementioned purchases.



Ever since the land was homesteaded in the 1860's there had been a public road into Red Rock Canyon. In 1943, the owners of the trailer park, located on the north end of the Bock property, closed the public road. Mr. and Mrs. Bock filed suit against the trailer park owners, but were ruled against. The Bocks were then forced to buy an additional piece of property and build a new road. Mr. Bock eventually bought the trailer park for $73,000. He also bought the undeveloped subdivision of East Manitou, which adjoined his Red Rock Canyon holdings on the west.

In 1960, John G. Bock passed his property down to his two sons, John S. Bock and Richard Bock. The two bothers had some extreme plans for this property and by 1975, published a Master Plan for the property. In 1970, John Bock Jr. opened up a landfill in Gypsum Canyon stating that he was filling the ravine so it could become a golf course. In 1973 the county commissioner gave approval to expand the landfill by 8 acres. In 1981 the county commissioner approved another 25-acre expansion. The landfill was closed in 1986.

Meanwhile, John and Richard had a falling out. Richard and his mother moved to Arizona and John became sole owner of the property. In the mid- to late-nineties John Bock Jr. wanted to sell the property. John looked at many offers during this time and marketed the property several ways. One offer that John looked at seriously was from Zydeco.

In the fall of 1998 Zydeco, a New Mexico based oil, gas, and development company, was interested in purchasing Red Rock Canyon. Zydecos initial plan was to have Manitou Springs annex the property. Zydeco wanted to build a posh, two-hotel and resort complex with 600 hotel rooms and an 18-hole golf course including 512,000 square feet of retail space, 1.39 million square feet of office space, 700 apartments, 800 single-family units and 60 luxury estates on the property. Opposition from grass root organizations forced Zydeco to scale down their original plan.

In May of 1999, Red Rock Canyon Committee hosted its first public meeting to raise awareness of Red Rock Canyon (RRCOS). This first meeting was the beginning of a grass roots movement to protect RRC and leave it as an Open Space. In December 2001, the Red Rock Canyon Committee submitted a new application to the Trails, Open Space, and Parks (TOPS) Program for funding of the purchase of the Red Rock Canyon property Open Space.

Zydeco went through several more steps before it realized that because of the landfill and other liabilities on the property, it couldn't make the numbers work and opted out of its contract to purchase the property. On November 27, 2002, the Trust for Public Land (TPL) secured an option to purchase the entire 787 acres from the John S. Bock estate. After six months of exploration of the property, the TPL sold the land to the city of Colorado Springs to be used as Open Space.

Currently, the Parks, Recreation, and Cultural Services Department has conducted public meetings to involve concerned citizens and groups wanting a voice in Red Rock Canyon Open Space. This process is on-going and hopes to establish an Open Space that the citizen of Colorado Springs can be proud of.

Purpose of the Plan

The purpose of the plan is to provide specific management direction for the natural, visual and passive recreational resources for the property. This plan is based on the best available information and provides a foundation for long-term adaptive management of the property and its resources.

Vision Statement

The Red Rock Canyon Open Space represents a southern continuation of the Garden of the Gods Park. Within the Open Space, unique geological formations, mixed shrub communities, mesas, bluffs and valleys can be seen. It is home to many wildlife species that can be observed from time-to- time. This Open Space will provide the Colorado Springs community with opportunities to hike, ride horses, rock climb, or just sit and take in the grandeur of this area. Red Rock Canyon Open Space is truly a unique, historical site for all to enjoy.

Goals

Preliminary goals for the Red Rock Canyon Open Space provide a philosophical foundation on which to base the Plan. These broad ecological and community goals will provide the basis for management actions related to issues such as wildlife habitat preservation, social trail restoration, visitor use, passive recreation, environmental education, interpretation and visual resources.

Ecological Goals

1. Manage the property to enhance conservation efforts.
    - Protect and enhance native vegetation.
    - Protect wildlife habitat.

2. Promote the conservation and restoration of natural communities.
    - Provide educational and interpretive activities and programs where opportunities exist, primarily at trailheads.
    - Provide passive recreation activities that do not degrade the conservation values of the property.

Community Goals

1. Maintain the Open Space as a wildlife refuge, scenic resource, and passive recreation resource.

2. Promote educational programs and trail opportunities where appropriate. Provide trailheads and ancillary facilities on the property.

Area Description

The Red Rock Open Space is a continuation of the famous geology of Garden of the Gods. The property is bordered on the north by Highway 24 and the Garden of the Gods. On the west side of this property is Manitou Springs and Pikes Peak. On the south side of this property is Manitou Section 16 and to the east is Colorado Springs and 26th Street.

A major asset of this property is the ecological contiguity of the property with Manitou Section 16 and Pike National Forest. There is potential for this area to act as a corridor for both wildlife and plants. It showcases regionally significant flora and fauna in an area accessible to most local residents, and it provides wide-ranging mega fauna with large areas to utilize, thus minimizing potential for human-wildlife conflicts on the urban edge.

This property has changed due to human impacts over the past century. John Bock created three ponds that changed the ecology of the land. The wetland areas **may** provide habitat for the Preble's Meadow Jumping Mouse, and has a potential to be a roosting site for the Bald Eagle. He also channeled the land to force water to those three ponds. This is potentially the only area on the property that animals can get water.

The most common vegetative communities in the Red Rock Canyon Open Space are Mountain Shrub, Mixed Grass, Pinon-Juniper, Cool Conifer, Mixed-Conifer, Niobrara, and Ponderosa-oak. The composition and condition of the present plant communities is determined primarily by the historic land use, soils, and precipitation.

The location of the Red Rock Canyon Open Space near a developed setting increases its importance as a scenic area as well as a buffer. Population growth in Colorado Springs has grown significantly, posing a threat to the greater Colorado Springs' natural environment. The Trails, Open Space and Parks (TOPS) was developed to preserve open lands, parks, and trails with in the Colorado Springs metropolitan area. The acquisition of the Red Rock Canyon Open Space by the TOPS program is part of this effort.

How to Use the Plan

The Red Rock Canyon Open Space Management Plan is a working document, which should change and evolve with the property. As Colorado Springs implements recommended actions and, as objective and goals change, the Plan should reflect those changes. The Plan should be used to:

1. Monitor the status of the resources of the Red Rock Canyon Open Space (see monitoring recommendations in the *Resource Management* section, on page 43).
2. Guide priorities (see management action recommendations for each resource in the *Resource Management* section).
3. Understand the specific resources of the Red Rock Canyon Open Space (see the *Resource Management* section).
4. Understand the overall goals for the Red Rock Canyon Open Space and ensure that all actions support those goals.

The Planning Process

The planning process for the Red Rock Canyon Open Space will take place over the course of five months. Upon completion, the Master Plan will be submitted to the Parks, Recreation, and Cultural Services Advisory Board for approval. The trails, trailheads, and ancillary facilities that have been proposed through the planning process, including public meetings, will be shown on the Master Plan. The primary trails will be for multi-use, and have been proposed to link to trails from Section 16 and the Garden of the Gods.

Plan Guidance

The City of Colorado Springs has established policies and plans that provide guidance on Open Space acquisition, management and planning. These policies and plans were used to shape the Management Plan. Policies and goals relative to the visual environment, Open Space, and natural resources translate into specific management actions. The Colorado Springs Open Space Plan, Parks, Recreation, and Trails Master Plan, TOPS Policies and Procedures Manual, Greater Outdoor Colorado regulations, EPA regulations regarding the landfill, and Bondholder interests are the principle influences that provide guidance for this Management Plan.

EXISTING CONDITIONS

There are many things in a management plan that are about the philosophical foundations in the plan, but in order to reach those goals the physical foundation must be looked at. This study entails the conservation values and management issues of Red Rock Canyon.

Conservation Values

Open Space

Red Rock Canyon is part of a magnificent geologic feature of red and white rocks that have been lifted up. It's located southwest of the very popular Garden of the Gods. This area creates a safe home for many animals, has many historical tails, unique geology, a place for people to recreate and it has cultural education potential. It also has scenic and ecological values.

Scenic Value

This property creates a connection that links with the Garden of the Gods, which will help preserve the unique structure of the land. The property has three small ponds and a few intermittent streams, which, along with the rock structures, creates astounding scenery. The rock structures are red and white rocks that have been uplifted due to the movement of the earth. The property is located at the foothills of the mountains, creating many places where there is a clear view of the mountain range.

Ecological Value

Red Rock Canyon contains unique uplifted rocks, valleys, bluffs, and prairie land which is home for many plants and animals. Most of the land has smaller plants such as mountain shrubs and mixed grasses however, there are several areas that contain trees such as pinon pine, juniper and several cool conifers. There is a grass-covered landfill in the southeast that is at its half life. There are areas which contain habitat for four endangered species: the Bald Eagle, Preble's Meadow Jumping Mouse, Mexican Spotted Owl, and Townsend's Big-Eared Bats. At this time, none have been found on the site. Critical habitat has also been identified for the Peregrine Falcon which has been recently down-listed from a threatened status.

Public Recreation

The public recreation will consist of walking, hiking, biking, limited climbing, picnic areas, dog parks and horseback riding.

RESOURCE MANAGEMENT

ECOLOGICAL LANDSCAPE AND PRESERVATION

One of the major goals of the TOPS program is to protect fragile ecosystems and support biodiversity. In the context of biodiversity, there are five levels of organization commonly considered: genetic, species, community, ecosystem, and landscape or regional (Noss and Cooperrider 1994). Red Rock Canyon has unique geological landforms that are at the northern foothills of the Pikes Peak Mountain range.

Due to the geological land formations, this area contains many different plant species. The majority of plants are: a mixture of mountain shrubs, mixed grasses which are in an open meadow, Pinon Pine-Juniper forest mix, cool-mixed conifers, and Ponderosa Pines and Oak mix. In the history of this land it was oceanic/lagoons, therefore the land is sandy making the soil hard to hold water, so many of the plants are non-water loving plants. In many areas this property is very sensitive to erosion so, minimizing human use and development in these sensitive areas is a key factor. The rock formations that are in Red Rock Canyon took millions of years to form and the land is still active so the geological structure will continue to change.

Critical habitat has been identified for the endangered Bald Eagle, Townsend's Big-Eared Bat, Mexican Spotted Owl, and the recently de-listed Peregrine Falcon. There are many other animals that live on this property consisting of a healthy population of birds, insects, and mammals. This area is a safe haven for animals like the black bear, mule deer, coyotes, red-tailed hawk and the great horned owl to live without the worries of the big city next door taking over.

VEGETATION

MOUNTAIN SHRUB COMMUNITY

The Red Rock Canyon property contains many plant communities. The dominant one is the mountain shrub community. It is characterized by three major components: Gambel oak (scruboak; *Quercus gambelii* Nutt.), mountain mahogany (*Cercocarpus montana* Raf.), and the three-leaf sumac (skunkbush; *Rhus trilobata* (Nutt) W.A. Weber). This mountain shrub community also contains an understory of mixed grasses. This understory differs across the property but includes the smooth bromes (*Bromes* spp.*)*, and native species of gramma grasses (*Bouteloua* spp.), muhly (*Muhlenbergia* spp.), needlegrass (*Stipa* spp.), and rye (*Elymus* spp.). In the Red Rock Canyon Open Space the mountain shrub community takes on three slightly different forms; on the map these are labeled as MS, MS.1, and MS.2.

MIXED GRASS COMMUNITY

The mixed grass communities (MG) are found among the mountain shrub communities in large openings. The grasses found in these openings are similar to the grasses that constitute the understory of the mountain shrub communities, and additionally include dropseed (*Sporobolus* spp.), wheatgrass (*Agropyron* spp.), and rice grass (*Oryzopsis* spp.). Native grass communities such as this are becoming increasingly rare in Colorado and constitute important foraging grounds for many animal species.

PINON-JUNIPER COMMUNITY.

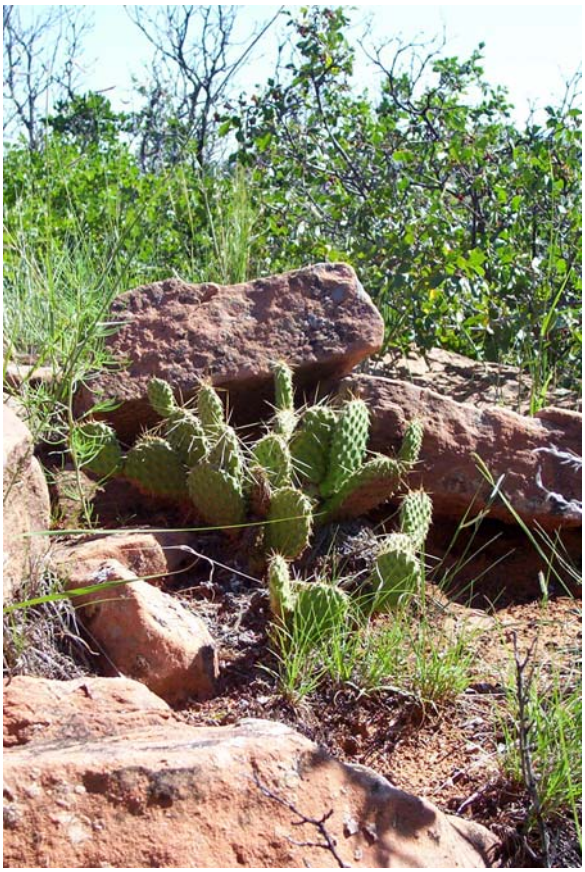
The pinon-juniper community (PJ) is only found on the western edge of the property in very rocky soil on exposed slopes. The two major components of this community are the pinon pine (*Pinus edulis* Engelm.) and the one-seeded juniper (*Juniperus monosperma (*Engelm.) Sarg.). Ponderosa pine (*Pinus ponderosa* Dougl. Ex Laws.) is also an occasional component of the pinon-juniper woodlands. While this community type typically grows on south-facing rocky slopes, it can also |occur as discrete subsidiary units throughout the mountain shrub communities. Understory

components include grasses, such as brome and rye, but more typically the understory is very open with a low cover of forbs and gramminoids.

THE COOL CONIFER COMMUNITY

The major components of the cool conifer (CC) community are Douglas fir (*Pseudostuga menziesii* (Mirbel) Franco), Colorado blue spruce (*Picea pungens* Engelm.), and ponderosa pine. Also included are the white fir (*Abies concolor* (Gord & Glen.) Lindl.) and the pinon pine. This community usually grows on north-facing slopes, often opposite the pinon-juniper woodlands on the south-facing slopes. However, due to the depth of some of the canyons found on the Red Rock Canyon property, the cool conifer forests are also found on both north and south-facing slopes deep in the canyons. Generally, the understory in this community is relatively sparse.

There are also communities of mixed conifers designated as MC on the map. The difference between mixed conifer and cool conifer communities is that mixed conifer areas are more open and contain more equal proportions of the southern slope species of pinon pine and ponderosa pine and the north facing slope species of Douglas fir and blue spruce. The shrubs, primarily Gambel oak and mountain mahogany, show up as understory components because the mixed conifer community shows up on areas with less of a slope angle.



THE NIOBRARA COMMUNITY

Many of the community types thus far have been associated with topography. The Niobrara (N) community is differentiated by its unusual bedrock and soils. This community occurs only in the calcareous layer of the Niobrara Formation on the eastern edge of the property. The major components here include four-winged saltbrush (*Atriplex canescens* (Pursh) Nutt.), winterfat (*Krascheninnikovia lanata* (Pursh) J.T. Howell), and mountain mahogany.

COMMUNITY TYPES WITH CONSERVATION SIGNIFICANCE

Several community types of conservation concern are recognized by the Colorado Natural Heritage Program (CNHP) and occur on the Red Rock Canyon property. Although, to a lesser extent than the mountain shrub, pinon-juniper, or cool conifer communities, these are considered to be biologically significant and sensitive to increased fragmentation in the Front Range corridor. Community types with conservation ratings on the property include the ponderosa pine and Gambel oak community, oak and mountain mahogany grassland, and two different narrowleaf cottonwood communities. There is also a wetland area on the property that, although artificially created, may contain rare habitat types and plant species.

A. *PONDEROSA PINE and GAMBEL OAK COMMUNITY*

Ponderosa pine and Gambel oak community (PO) is a listed community by the CNHP, with an S4 rating. This means that, although this community type is fairly abundant, it is being fragmented and diminished from its prior extent. The major components of this community type are the ponderosa pine and Gambel oak. Limber pine (*Pinus flexilis* James) was also found on the edges of this community, which occurs along some of the sandstone formations on the property usually on east or west-facing slopes.

B. *MOUNTAIN SHRUB-MOUNTAIN MUHLY COMMUNITY (open mountain shrub)*

The CNHP does not list the MS.1 community type unless it is found with the grass, mountain muhly. This community is listed as SU, which means the distribution and abundance is not officially known. In Colorado, this community is found mainly along the Front Range in the foothills; development has substantially diminished this community type which has lead to its conservation rating. In Colorado Springs, dense oak and mountain mahogany thickets used to run continuously from Cheyenne Mountain through the Red Rock Canyon area north to the Palmer Divide, an extensive belt now fragmented by development. This community is important nesting and feeding habitat for birds, residential and migratory, and for many species of butterflies, including the Colorado hairstreak (*Hypaurotis crysalus*), which feeds exclusively on Gambel oak.

C. *NARROW-LEAF COTTONWOOD COMMUNITIES*

Two narrow-leaf cottonwood communities are found in the deep, cool canyons on the Red Rock Canyon property. They do not have a map code due to the small area they cover. This habitat is

unusual here and can support more mesic vegetation and greater diversity due to cooler temperatures, higher humidity, and increased water catchment than other parts of the property.

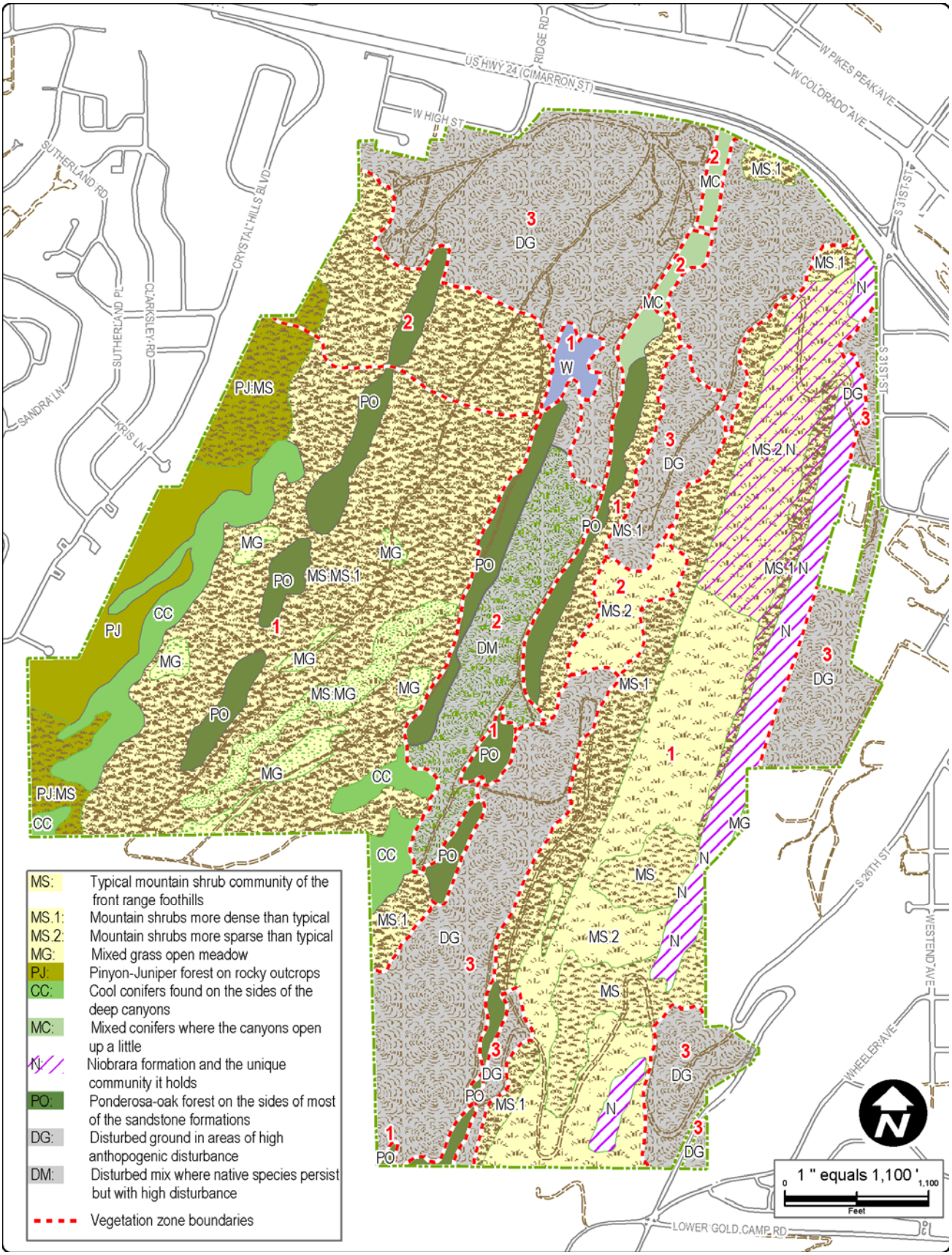
The first of the two narrow-leaf cottonwood communities is the narrow-leaf cottonwood (Populus angustifolia James) and the sandbar willow (*Salix exigua* Nutt.). This has a CNHP rating of S4. Other species found in this community type include Bebb willow (*Salix bebbianna* Sargent), wild rose (*Rosa woodsii* Lindl.), box elder (*Acer negundo* L.), snowberry (*Symphoricarpos* spp.), and ninebark (*Physocarpus* spp.).

The second narrow-leaf cottonwood community type is very unusual in Colorado. Currently, it receives an S1 rating, the highest conservation concern for the state. The two major species here are narrow-leaf cottonwood and choke cherry (*Prunus virginiana* L.), with secondary components similar to those found in the narrow-leaf cottonwood/ sandbar willow community. In addition to being rare, this community also provides a major food source for wildlife, especially bears in the fall, as well as for many bird species. The dense-layered vegetation here provides critical habitat for a number of resident and migratory bird species year round.

D: *WETLANDS*

The wetlands area, found at the north end of Greenlee and Red Rock Canyons, is artificially created. However, in eastern Colorado, any area with a significant amount of water, whether naturally occurring or not, can be of ecological significance. Many of the rare plant species listed by the CNHP need large amounts of water in order to survive. Due to the vegetation study being conducted in October 2003, this area was not as extensively studied because most of the aquatic species are forbs and so would not have been identifiable at this time of year. However, this area has the potential to be biologically rich and ecologically important as a local source for resident and migratory wildlife.

Figure 3: Red Rock Canyon Vegetation Map



Invasive and Noxious Weeds In Red Rock Canyon Open Space

Noxious weeds threaten native plant communities by displacing desirable native species. The Colorado Weed Management Act of 1990 identifies both Statewide and County-wide noxious weeds and obligates all Colorado counties to use Integrated Weed Management techniques to control them (Table 1). When used together, these techniques are the least harmful and most beneficial methods for weed control.

Technique	*Definition*
Mechanical	Physical removal by mowing, mulching, tilling, prescribed burning, grazing, or hand-pulling
Cultural	Enhancement of the native plant community using fertility management or re-vegetation.
Biological	Releasing a weed's native natural enemies using insects, grazing animals or disease.
Chemical	Destroying weeds using herbicides that do not adversely affect the desired plant community.

Table 1: Integrated Weed Management techniques.

The TOPS program accomplishes noxious weed control through the Parks, Recreation, and Cultural Services Department, which uses an integrated pest management approach to weed control. Integrated pest management is a decision-making process that selects, integrates, and implements control methods to prevent or manage noxious weeds. It focuses on long-term prevention or suppression of undesirable species while reducing the impacts that control techniques may have on the environment, human health, and non-target plants and animals.

The most important part of a noxious weed management program is prevention. We can help prevent the spread of noxious weeds through education and strategic trail and recreation management.

Vegetation Management Recommendations

Draft a forest management plan that specifically addresses long-term forest health.

Recommendations
Monitor sensitive plant communities.
Encourage visitor use to be restricted to establish trails only. Discourage social trails with signs and monitor the effectiveness.
Re-seed disturbed areas with native seed mix. This includes the staging area in the northern grassland, social trails, and along the water and sewage lines.
Re-vegetate disturbed areas, such as the former gravel pits, with native shrub and tree species.
Fire is also a risk on the property. Although natural sources of fire, such as lightning cannot be controlled, no smoking signs and signs warning of high fire danger during times of drought are advisable.
Monitor Siberian Elm stands. Remove Elms that encroach into native plant communities.

Wildlife

Habitat and Descriptions

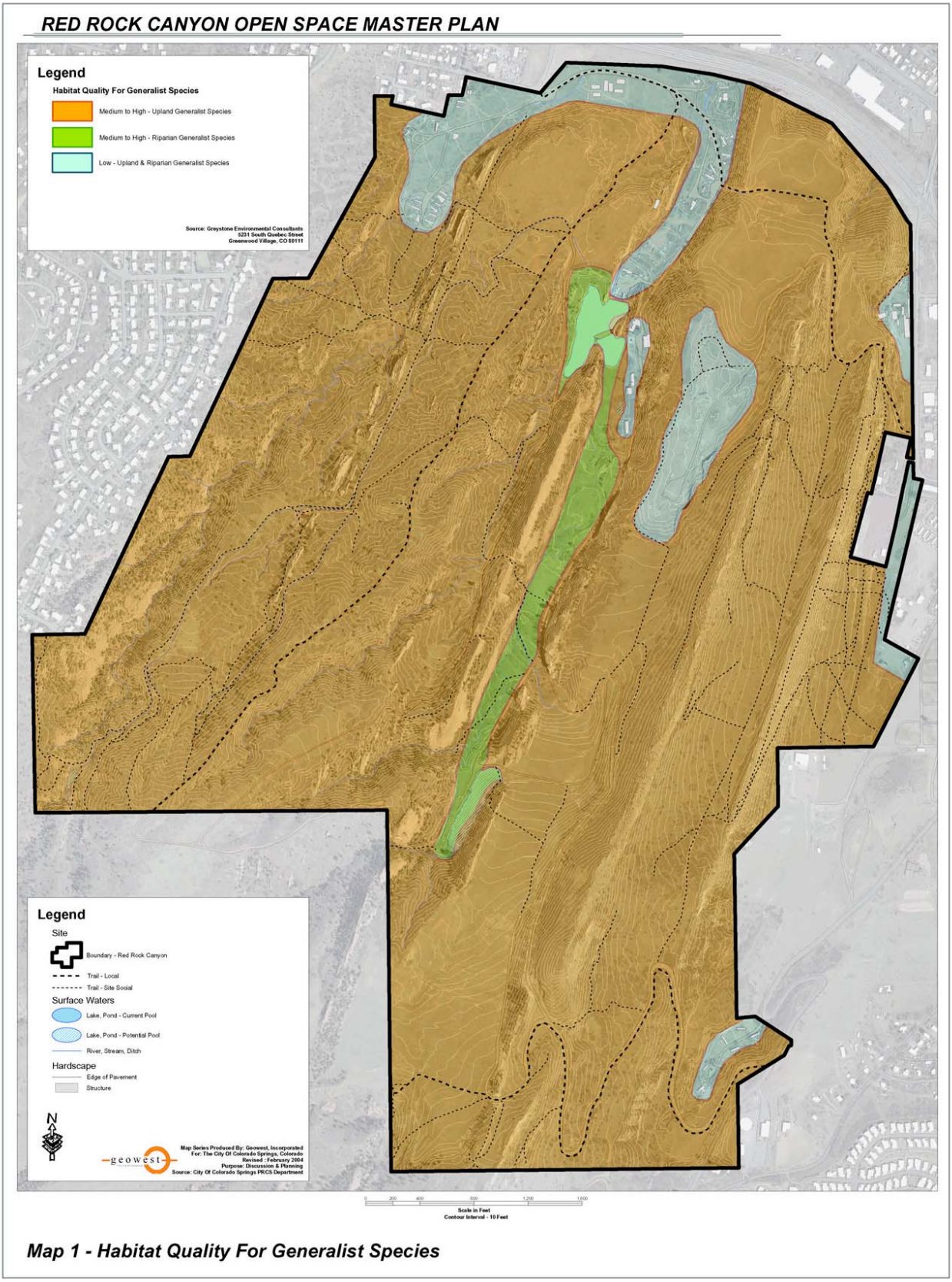
Red Rock Canyon Open Space (RRCOS) is located in the foothills of the Pike's Peak Region. This area supports a healthy population of birds, insects, and mammals. Mammals and birds routinely sited in and around the park include coyotes (cnaus latrans), mule deer (Odocoileus hemionus), black bear (Ursus americanus), raccoon (Procyon lotor), mountain lion (Felis concolor), Thirteen-lined ground squirrel (Spermophilus triecemlineatus), White-tailed jackrabbit (Lepus townsendii), Black-billed magpie (Pica pica), American sharp – shinned hawk (Accipiter striatus), American robin (Turdus migratorius), Red-tailed hawk (Buteo jamaicensis), American crow (Corvus brachyrhynchos), and the Great-horned owl (Bubo virginianus). A complete survey and inventory of all mammals, reptiles, and arthropods should be conducted by the Colorado Division of Wildlife and the U.S. Fish and Wildlife Service.

There is suitable roosting and foraging habitat throughout the property. Although some of the species listed may not be seen, the habitat is conducive to support them. For example, raptors may use the areas along the transmission lines that intersect the property or the southern portion of the property, which is more elevated and contains mature coniferous trees suitable for nesting raptors. American kestrels, Merlins, peregrine falcons, Cooper's hawks, northern goshawks, golden eagles, and red-tailed hawks are raptors that may be seen anytime in Red Rock Canyon.

Disturbed Habitat

The pond at the end of Greenlee and Red Rock canyons contain riparian vegetation such as willows and cottonwoods. This area has the potential for riparian species such as: tiger salamander (Ambystoma tigrinum), woodhouse toad ((Bufo woodhousii), western chorus frog (Pseuudacris triseriata), painted turtle (Chrysemys picta), bullsnake (Pituophis catenifer), killdeer (Charadrius vociferous), the red-winged black bird (Agelius phoeniceus), and many other species. Because there is a lack of riparian area on the property, this pond should be conserved. Other disturbed areas on the property that could support wildlife would include the former landfill. The reclaimed vegetation on the landfill site could support foraging populations of species such as mule deer, sparrows, and rabbits. Although this area could support foraging needs of these animals, it has limited habitat value. Refer to the following map for disturbed areas.

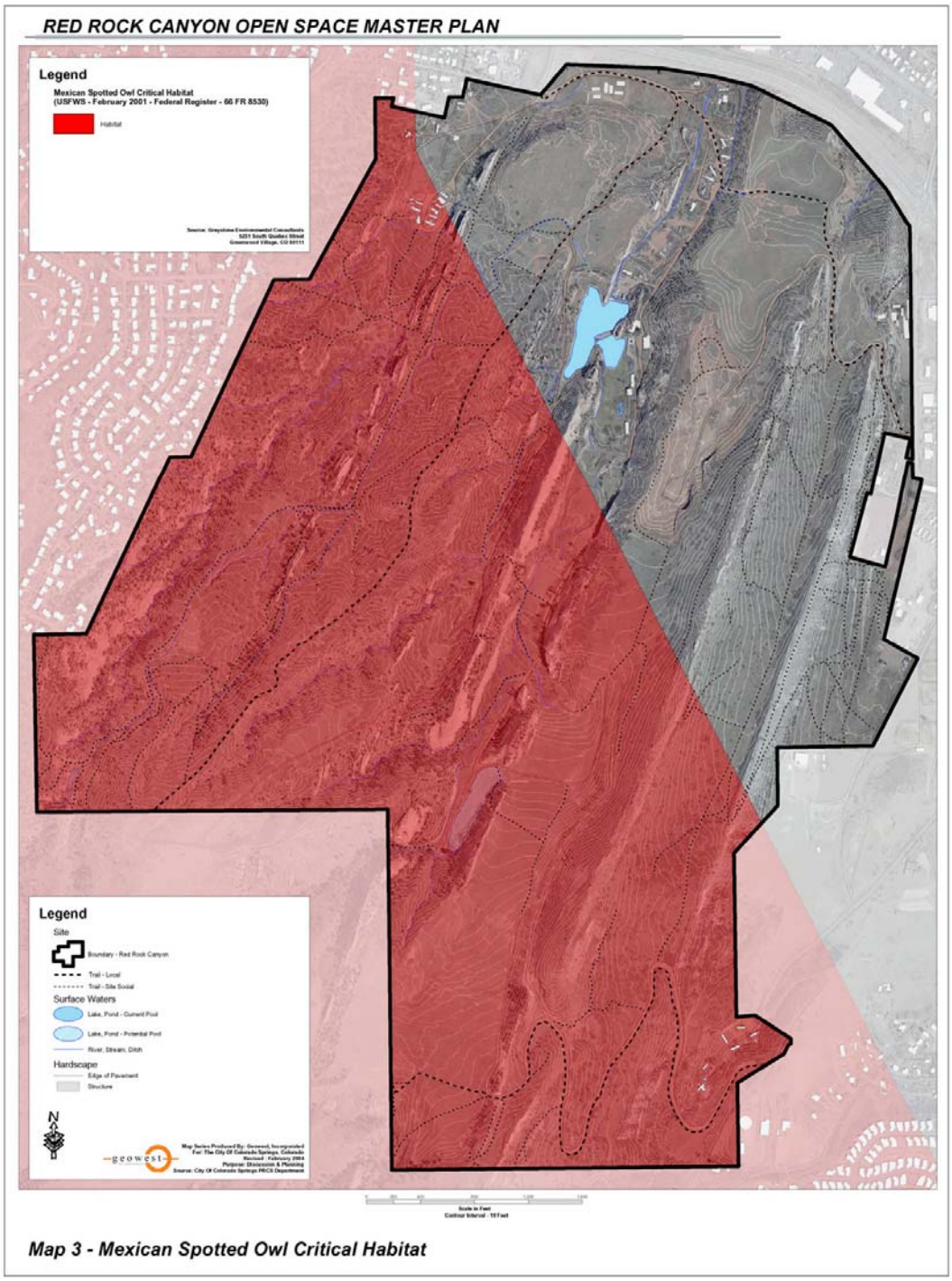
Figure 4: Habitat Quality for Generalists Species



Sensitive Species Habitat

There are five federally listed species that have the potential of inhabiting this site. They include bald eagle, Mexican spotted owl, Preble's meadow jumping mouse, peregrine falcon, and the Townsend's big-eared bat. The peregrine falcon, although being de-listed, is still monitored. Bald eagle habitat would include tall, living trees in which to build their large, heavy nests.

Figure 5: Mexican Spotted Owl Critical Habitat



Bald eagles prefer large, open branched trees close to lakes, reservoirs, and rivers. Bald eagle's prey is small mammals, fish, and some waterfowl. Because there are few water sources on the property and limited prairie dog towns, another favorite of the bald eagle, the occurrence of bald eagles is limited. The adjacent properties may contain more foraging habitat for the eagles and there may be brief occurrences of the animal because of this.

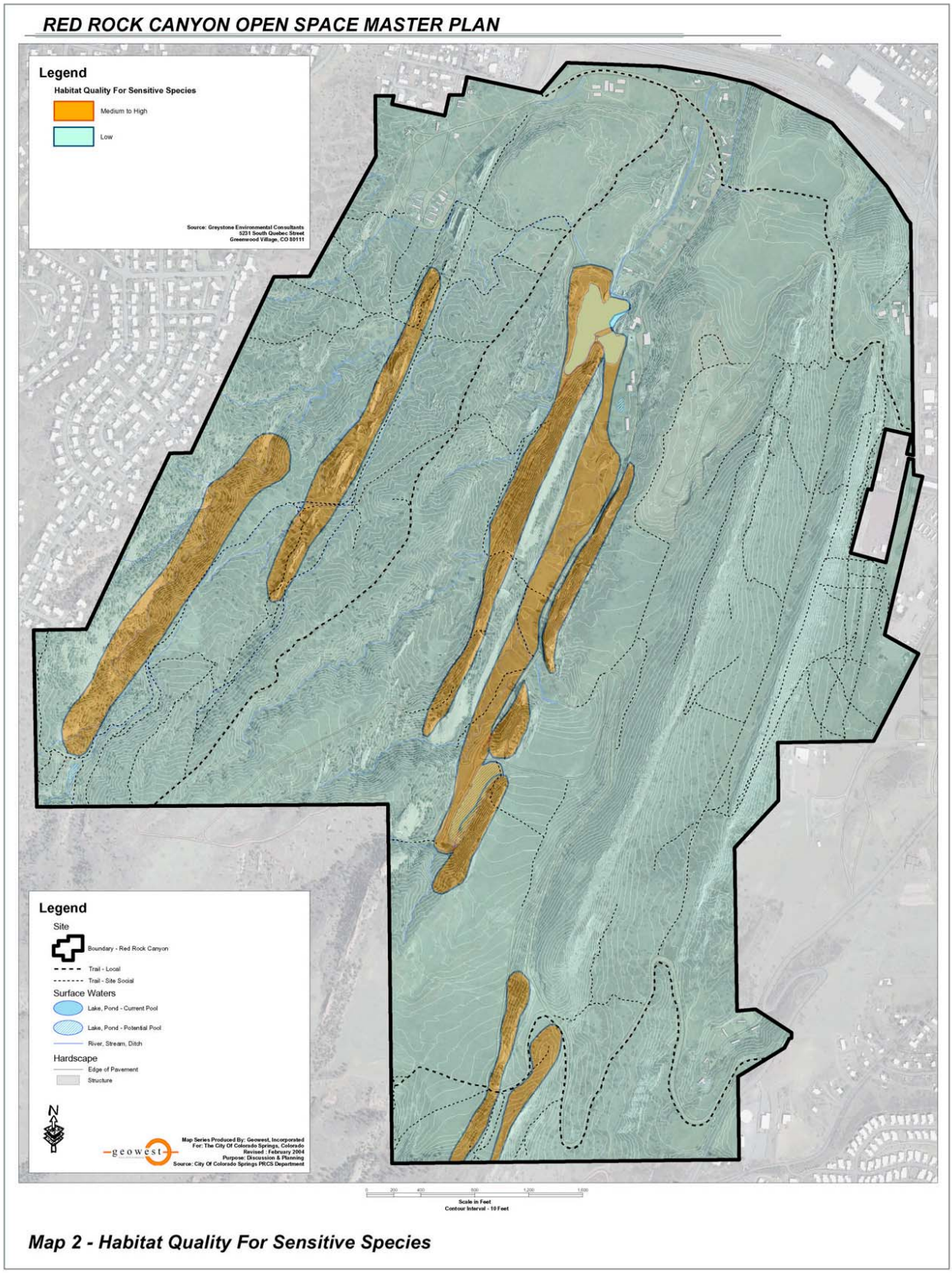
Mexican spotted owls roost in old growth mixed coniferous forests. They can also occur in caves, steep mountain side crevices, and narrow canyons. A large portion of the property includes critical habitat for the Mexican spotted owl. Any modification of a listed species habitat would require a consultation of the U.S. Fish and Wildlife Service. The areas that would most likely support the Mexican spotted owl are shown in the map below. Any development in these areas would not be recommended without further consultation with the US Fish and Wildlife Service.

The Preble's meadow jumping mouse requires a healthy riparian area containing cottonwood and willow trees and a thick grassy area in which to feed. The manmade ponds have the potential for supporting Preble's although it is highly unlikely since there is no logical means for the species to have migrated since the site lacks perennial streams.

The areas along the hogbacks and cliffs are medium to high habitat for the peregrine falcon. The rock cliffs and the occurrence of pinon, juniper, and ponderosa pine provide ideal nesting areas for this raptor. Small mammals, waterfowl, and birds are prey for this raptor. Because of the high potential of peregrine falcons, any potential nesting areas should be left undisturbed.

The Townsend's big-eared bat has a potential for inhabiting this property. They like rocky outcrops, caves, and moist forest habitat. Much of the Townsend's foraging occurs over water. Because there is a lack of standing water on the property, the expected occurrence is low. However, potential Townsend's habitat should be taken into consideration when trails and other development occur on the property. The following map illustrates sensitive species areas.

Figure 6: Habitat Quality for Sensitive Species



Wildlife Management Recommendations

1. A management plan should be developed in conjunction with El Paso County, the Colorado Division of Wildlife and the U.S. Fish and Wildlife Service.
2. Trails in the park not being used or that are in close proximity of critical habitat should be reclaimed. New trail construction should take into account these critical areas too.
3. Access into the RRCOS from residential areas that border the property should be closed to minimize disturbing wildlife habitat.
4. The ponds should be reclaimed to provide maximum critical habitat for the desired species. The existing disturbances in, and around, the riparian areas should be reseeded with a wetland vegetation seed mix.
5. A thorough study and inventory of all animals on the property should be completed. This study will serve as a baseline for wildlife and their habitat occurring on the property. This baseline study can then be incorporated into improvement activities that will occur on the property.
6. It is recommended that any future improvement activity first have a sensitive species study completed. This activity should be done on a project-by-project need.

Geology

The geology in Red Rock Canyon is very special because in the Permian period (290-248 million years ago) this land was a dune off the coast. Now the land has uplifted and many of the layers of sandstone are at a 90-degree angle. The geology in the park is the same as Garden of the Gods. There are several formations that are very special and need to be protected from destruction. All of the major formations and a brief explanation follow.

Fountain Formation

This formation is in the Pennsylvanian and early Permian period. Its age range is from 300-248 million years old. Its color is a reddish-brown arkosic conglomerate with pebbly sandstone and contains thin layers of dark reddish-brown shale. Due to it being a conglomerate, this formation can withstand high usage with little damaging effects.

Lykins Formation

This rock formation formed in the Triassic period. Its age range is from 206-248 million years old. Its color is a reddish-brown and gray. This formation consists of shale and limestone beds which were deposited as marine, beach and lagoonal environment. This formation is more sensitive in the shale deposits which will be a green, silty color and the limestone deposits will be a more orange and gray color. Due to the shale in this formation, the usage should be limited.

Lyons Formation

This rock formation is in the Permian period. The age range is from 248-290 million years old. This structure is a mud/conglomerate that is a mostly red and white color. The grains are fine-to-medium grained, crossbedded quartzoes and hematitc sandstone that are all well cemented.

Morrison Formation

This formation was formed in the Jurassic period. Its age can range from 144-206 million years old. It is mostly a reddish-brown color and consists of white to brown sandstone, white to brown claystone and brown siltstone with dark gray gypisferous shale. This formation is from a fluvial

and paludal environment. This area varies in its erosion possibilities, therefore it should be checked for erosion more frequently than other areas depending upon usage in this area.

Ralston Creek

This formation was created in the upper Jurassic period. Its age range is between 175-144 million years old. This formation underlines the Morrison formation and is a light-reddish-drown to tan and has sandstone, shale, limestone and gypsum interbedded in sequence.

Dakota Formation

This formation was formed in the lower Cretaceous period. Its age range is 100-144 million years. This formation consists of white and yellowish-brown quartz sandstone interbedded with gray shale. This formation was made by a near shore fluvial or tidal-flat environment. This formation erodes by pieces breaking off, therefore, usage should be limited and no climbing should be allowed.

Niobrara Formation/Carlile Shale

This formation was created in the upper cretaceous period. Its age range is 79-65 million years. The Niobrara formation consists of Fort Hayes Limestone, which is a gray color and has traces of chalky limestone and shale. The Carlile shale consists of dark-gray shale interbedded with dark-brown sandstone, yellowish-brown siltstone and gray limestone. This area should have very little to no contact due to the high erosion rate of shale.

Greenhorn Limestone/Graneros Shale

This was created in the upper cretaceous period. Its age range is 79-65 million years. The greenhorn consists of dark to light gray limestone with a few shale and siltstone interbeds. This area can withstand high-use recreation. The Graneros is black marine shale with thin interbedded bentonite beds. Depending on the slope, this area may also be suited for high recreational use.

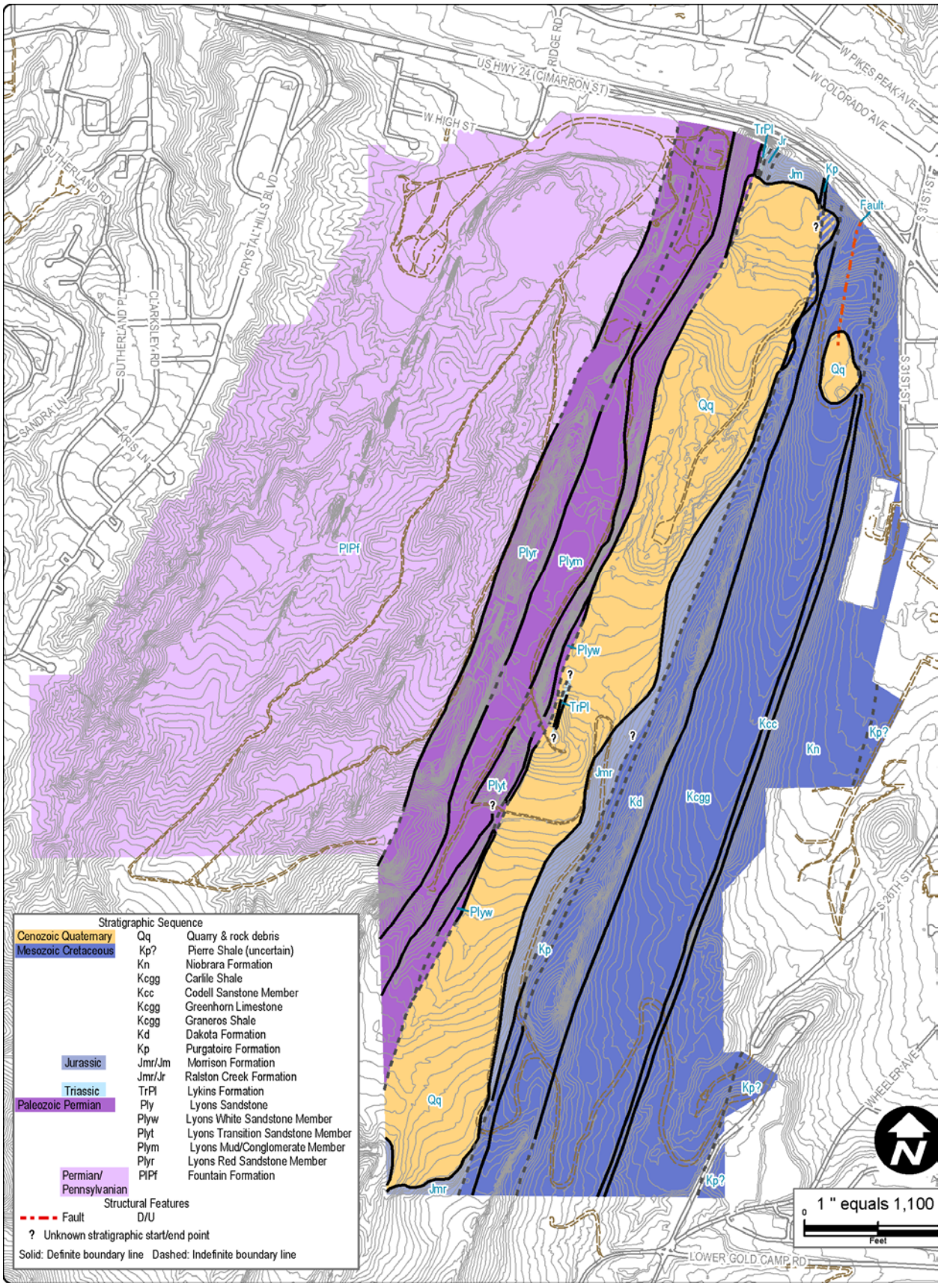
Faults

There is only one fault that is found in Red Rock Canyon. This fault is located in the northeast corner of the property.

Management

The goal for the rock formations in Red Rock Canyon is to keep them in their natural state. There are two objectives that will make this goal a reality: 1) Protect the formations form erosion and from visitor use, and 2) Prevent noxious weeds from growing on the formations. 3) Manage rock climbing activities by limiting numerous routes and preventing rock scrambling. Too much human contact with the geological formations will cause erosion rates to speed up and can make pieces of the formations break off. Due to the proximity of Colorado Springs, vandalism will likely occur, including graffiti, carving words into the stones, and people senselessly breaking off parts of the formations. This can be prevented by the recreational users keeping an eye out for these things and to notify the police as soon as it's seen. Not allowing noxious weeds to grow on the formations will stop roots of these non-native plants from penetrating the formations, which could cause breakage. Native plants should be allowed.

Figure 7: Geology Map



CULTURAL RESOURCES

Prehistoric

On the Red Rock Canyon property studies have found one lithic scatter site, as well as seven isolated finds. In addition to this, several previously collected tools were identified and recorded.

The lithic scatter site is dated to the Late Prehistoric Stage (AD 100 to 1725), and consisted of a tan, orthoquartzite core with one piece of angular debris and one flake. The site also revealed one broken salmon-colored chert biface, one chert-tested coble, and one Black Forest petrified wood flake. The landfill cuts away at the northwestern boundary of this site, probably resulting in some material loss.

The seven isolated finds consisted of flakes, both chert and quartzite, sandstone manos and a sandstone metate. Also, chert angular debris were found.

Historic

The historical survey has identified a cave with historic engravings, evidence of early quarries with supporting roads, and the foundations of the Colorado-Philadelphia and the Standard Mills. Also, the survey has found an unsanctioned dump area with historic materials, historic engravings, stone features, a can/bottle scatter, and a sandstone brick/concrete wall isolate.

VISITOR USE

Visitor opportunities in the Red Rock Canyon Open Space will be wide and varied, including many non-motorized recreation uses as defined under the TOPS initiative, as well as nature and geology interpretation. The majority of the trails will be multi-use, and appropriate facilities should be provided for these uses and should not interfere with the conservation of the property.

VISUAL RESOURCES

The scenic aspect of the Red Rock Canyon Open Space is of the highest quality. As the name suggests, unique rock formations, canyons, and mesas, as well as conifer and shrub forests, and

grass meadows all make this area very scenic and provide wildlife viewing and a visual relief for the City of Colorado Springs.

Rock formations enhance the scenic value of the Open Space. The formations vary in age from 300 million years to 65 million years old. It is possible to view all of these formations from one trail loop. As these rock formations erode they provide the basis for many plant communities including conifers, shrubs, and grasses.

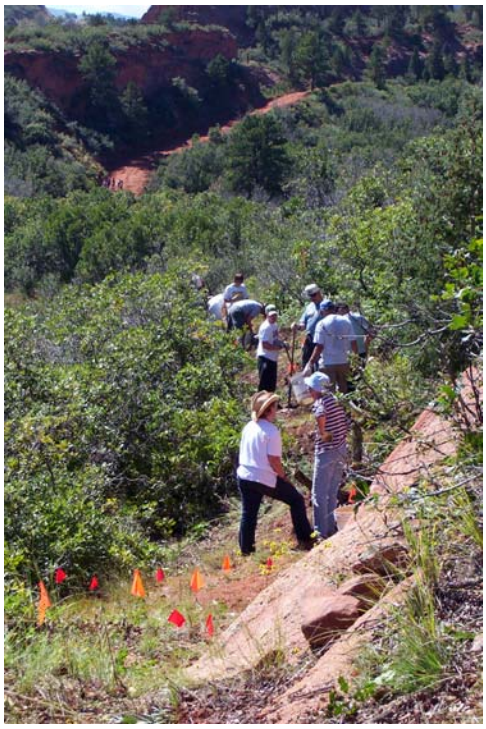
TRANSPORTATION AND ACCESS

Roads

Red Rock Canyon and Open Space is located approximately 2.5 miles from interstate I-25 heading west on highway 24. Red Rock Canyon is located on the south side of Highway 24. The park entrance is located on a dirt road starting adjacent to the mail boxes at the entrance. The park is not open yet, but group tours are available by contacting the Colorado Springs Parks, Recreation and Cultural Resources Department for more information.

Parking

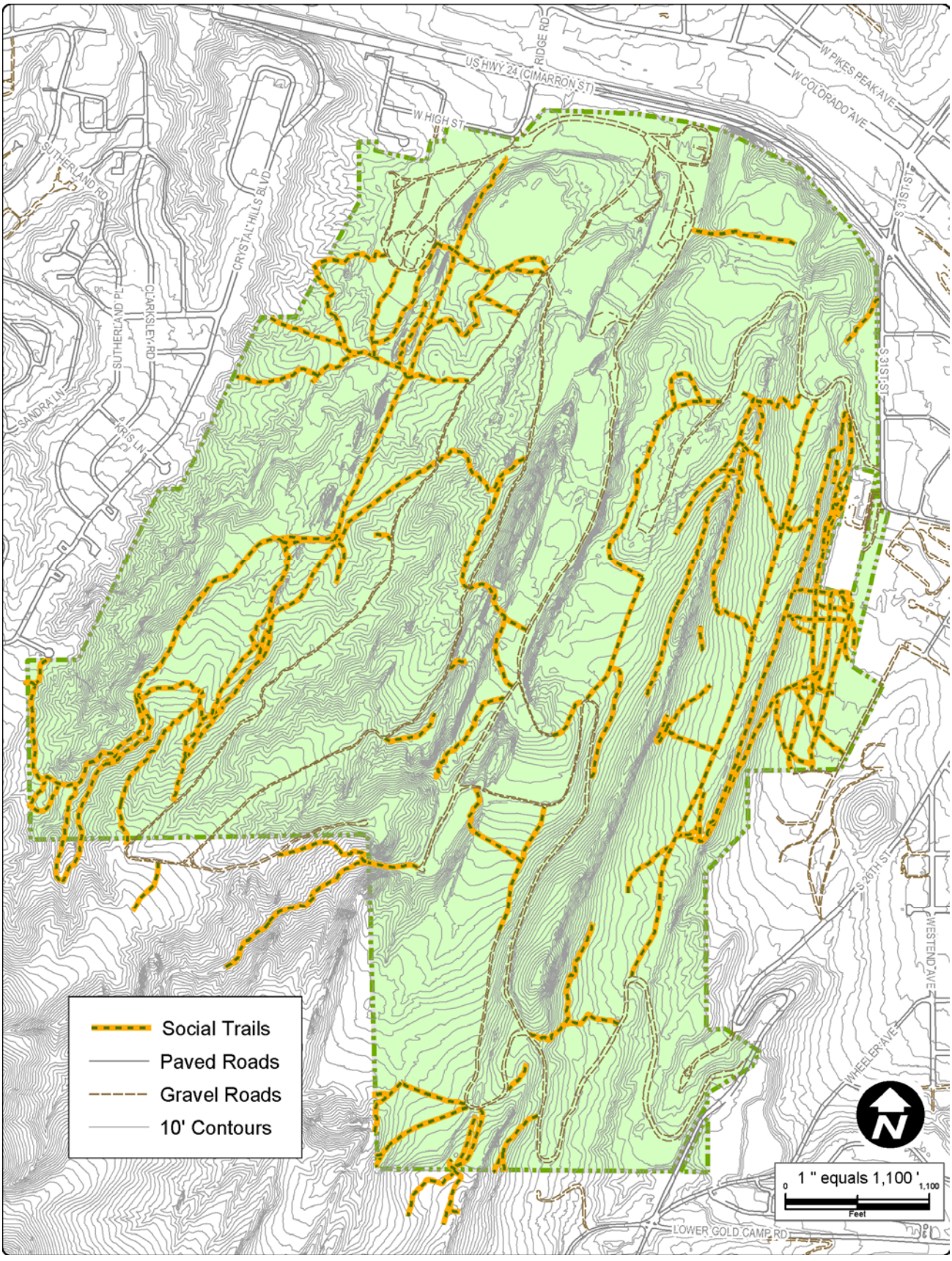
Currently located east and west of the mail box area. The public is asked not to block the area around the mailboxes because residents need to be able to access their mail.



Existing trails

The previous owner of the property maintained several roads and trails within the park (see map below). All of the current trails, roads, and proposed trails are under consideration. Five public meetings were held to compile an agreed upon multiple use trail system. Currently under discussion are social, biking, dog runs, horse, and multiple use trails.

Figure 8: Inventory of Existing Trails



MANAGEMENT ZONES

Achieving the balance between resource protection and visitor use is a difficult task. Management zones that describe the emphasis of use of Red Rock Canyon Open Space have been developed as part of this ***Management Plan***. There are areas of Open Space that will need to be managed differently and allow for resource protection and visitor use. Significant factors influencing the management zones include:

- Protecting sensitive riparian areas.
- Protecting sensitive wildlife habitats.
- Protecting the scenic values of Red Rock Open Space.
- Further protection of the landfill.

The sensitive natural resources zones include many parts of the property because of the potential presence of the Mexican spotted owl, Bald Eagle, Townsend's Big Ear Bat, Peregrine Falcon, and the Preble's Meadow Jumping Mouse. The reclaimed landfill has a low density of forbs and no trees. The reclaimed vegetation on this site supports foraging populations of upland generalist species such as mule deer, sparrows, and rabbits. Recreation should be prohibited or seasonal closures enforced in these areas. The ponds should be reclaimed to fit determined uses and protect critical habit. The existing disturbances in, and around, the riparian areas should be reseeded with a wetland vegetation seed mix.

Table 2: Individual resources and management priority within Sensitive Natural Resources Zone

Natural Resource	***Priority***
Landfill	**Medium**
Potential presence of Mexican spotted owl	**High**
Potential presence of Bald Eagle	**High**
Potential presence of Peregrine Falcon	**High**
Potential presence of Townsend's Big Ear Bat	**High**
Potential presence of Preble's Meadow Jumping Mouse	**High**
Riparian Area around pond	**Highest**

PLAN IMPLEMENTATION

Identification and prioritization of management actions will be required to implement the plan and accomplish management objectives and plan goals. These prioritized management actions should be reviewed on an annual basis to determine annual work programs given budget and staff constraints. Implementations of the Red Rock Canyon Open Space Management Plan also needs to be balanced with other resource needs throughout the Open Space system. Many of the management actions will be implemented within the first few years of approval of the plan, while others will take many years to accomplish. Some management actions are ongoing, some are short-term, and others are long-term, representing considerable investments of time and energy.

Table 3 is a prioritized summary of management actions. The summary is derived from all the individual resource goals, objectives, and recommended management actions in the body of the plan. The table is arranged by individual resource section. Column one summarizes the management goals, objectives and recommended actions. The second column describes timing or how long it will take to accomplish an action:

- **Short term actions (S)** should take less than one year to accomplish.
- **Long term actions (L)** will take more than one year once they have been started.
- **Ongoing actions (O)** may involve considerable time and energy and will continue indefinitely over time.

The third column prioritizes specific management actions. Management actions have been evaluated and prioritized according to "high," "medium," and "low' in table 3. Criteria for prioritization include the urgency, importance, and relationship of each action to other resource goals, objectives and actions. Other considerations include community need, legal requirements, budget, and personnel.

- **High priority actions (1)** should be accomplished first. These management actions are considered extremely important to the protection of the conservation values of Red Rock Canyon Open Space. High priority actions are directly related to the accomplishment of other resource objectives and goals.

- **Medium priority actions (2)** are considered important, but not urgent, and meet a combination of other resource goals and objectives.
- **Low priority actions (3)** are important, but not critical to resource protection needs. Low priority management actions do not have to be completed in the immediate future and primarily fulfill a specific goal or objective.

Table 3: Summary of Management Recommendations

MANAGEMENT GOALS, OBJECTIVES, AND ACTIONS	TIMING	PRIORITY
Goal: Control the Spread of Noxious Weeds Protect and Enhance Native Vegetation and Restore Degraded Plant Communities On the Property.		
Objective 1: Control invasive weeds through education of staff members, visitors, and adjacent landowners about Open Space preservation.		
● Action: Develop educational guided hikes throughout the Open Space that provide staff members and visitors with noxious weed identification skills and control measures.	S	2
● Action: Work with El Paso County to develop a plan for the control of noxious weeds in the neighboring areas of Section 16.	O	1
Objective 2: Control invasive weeds through strategic trail management.		
● Action: Minimize ground disturbance and soil compaction resulting from trail construction and maintenance activities.	O	2
● Action: Use weed-free materials in trail construction and maintenance.	O	1
● Action: Clean all equipment used in trail construction and maintenance before using in a new area.	O	1
● Action: Reclaim social trails and other disturbed areas immediately to reduce the chance of weed infestation. See disturbed ground (DG) on vegetative map.	L	1

MANAGEMENT GOALS, OBJECTIVES, AND ACTIONS	TIMING	PRIORITY
Objective 3: Control invasive weeds through strategic recreation management.		
● Action: All users should not pick wildflowers or noxious weeds to avoid seeds falling off transported flowers.	S	2

Goal: Management Techniques of Specific Noxious Weeds Use Integrated Weed Management techniques to control invasive weed species present in the area.		
Objective 1: Control the spread of Siberian Elm (*Ulmus pumila)* into sensitive areas such as Sand Bench, Sand Canyon, the valley between the Dakota and Niobrara hogbacks, the entrance to Black Bear Canyon, and Greenlee Canyon. (Reis, Halteman, Kelso)		
● Action: Pull new seedlings yearly or bi-yearly in the fall.	O	1
● Action: Thin large trees to diminish the seed bank.	L	1
● Action: Use an herbicide application such as glyphosate as a cut-stump treatment for large cut trees. (Wisconsin Department of Natural Resources)	L	1

Objective 2: Control Dalmatian Toadflax (*Linaria dalmatica*) in the drainage from Sand Canyon. (Reis, Halteman, Kelso)		
● Action: Integrate chemical and cultural techniques by treating Dalmatian Toadflax with herbicide in early September, then seeding the following year in April or August with native grasses. (Beck)	O	1

Objective 3: Control Canada Thistle (*Cirsium arvense*) in Sand Canyon and its drainage. (Reis, Halteman, Kelso)		
● Action: Treat Canada Thistle with herbicide in the Spring when the plant is in pre-bud stages, and again in the fall. (Beck)	O	1
● Action: In addition to herbicide treatments, use monthly mechanical controls such as pulling or mowing to decrease the plant's root nutrient stores. (Beck)	O	1

MANAGEMENT GOALS, OBJECTIVES, AND ACTIONS	TIMING	PRIORITY
Objective 4: Control the spread of Russian Olive (*Elaeagnus angustifolia*) near the entrance to Black Bear Canyon (Reis, Halteman, Kelso)		
● Action: Pull new seedlings yearly or whenever found.	O	1
● Action: Thin large trees to diminish the seed bank.	L	1
● Action: Use an herbicide application such as glyphosate as a cut-stump treatment for large cut trees. (Minnesota Department of Natural Resources)	L	1
● Action: Mow hedges and remove cut material. (Muzika)	L	1

Goal: Wildlife Protect wildlife habitat and movement corridors.		
Objective 1: Inventory wildlife populations that use the property and monitor changes in their frequency, distribution and behavior		
● Action: Conduct a thorough study and inventory of wildlife on the property.	S	1
● Action: Develop the management plan in conjunction with the Colorado Division of Wildlife and the U.S. Fish and Wildlife Service.	S	1
● Action: Determine sensitive species population and their habitat. Take action to protect these specie(s) overall and on a project-by-project basis.	S	1
● Action: Coordinate wildlife surveys and studies with other agencies to share information.	O	2
● Action: Integrate sensitive wildlife habitat in all management actions.	O	2

MANAGEMENT GOALS, OBJECTIVES, AND ACTIONS	TIMING	PRIORITY
Objective 2: Protect or enhance riparian area around ponds.		
● Action: Identify riparian enhancement needs and opportunities.	L	1
● Action: Provide for wildlife corridor enhancement.	O	2
● Action: Remove any internal fencing that might restrict wildlife movement.	S	2
Objective 3: Coordinate wildlife management and habitat conservation projects with neighboring landowners.		
● Action: Conduct outreach activities with neighboring landowners and address the potential conflict between domestic animals and wildlife.	O	3
● Action: Continue discussion with adjacent landowners regarding conservation and trail easement.	O	3
● Action: Access to the park from residential areas that border park should be closed to minimize the disturbance to wildlife.	S	2

MANAGEMENT GOALS, OBJECTIVES, AND ACTIONS	TIMING	PRIORITY
Goal: Historical and Cultural Resource Provide quality educational experiences through interpretive programs.		
Objective 1: Present and interpret cultural and historical resources.		
● Action: Develop an interpretive plan for the property that considers significant cultural and historical features such as ranching and quarrying.	L	3
● Action: Collaborate with the Cultural Resources Division to develop an interpretive plan that considers wildlife and historical uses of the property.	L	3

MANAGEMENT GOALS, OBJECTIVES, AND ACTIONS	TIMING	PRIORITY
Goal: Visitor Use		
Objective 1: Provide appropriate recreational facilities.		
● Action: Establish a trail system in accordance with the Red Rock Canyon Open Space Master Plan and the City Multi-Use Trail Plan.	S	1
● Action: Construct parking lots/trailheads and restroom facilities in areas designated on the Red Rock Canyon Open Space Master Plan.	S	1
Objective 2: Preserve scenic values of the property.		
● Action: Use existing roads or utility easements wherever possible. Some trails should utilize social trail corridors also.	S	2
● Action: Design parking lots, restrooms, and visitor facilities to minimize the visual impact to the Open Space.	S	2
Objective 3: Discourage vandalism and other undesirable impacts to the property.		
● Action: Make arrangements for law enforcement to drive by the trailheads on a regular basis.	O	1
● Action: Construct signage in accordance with the Parks, Recreation and Cultural Services Department Sign Policy.	S	3
● Action: Consider creating a neighborhood watch group and Adopt a Park group to monitor use and trash control.	O	2
Objective 4: Minimize conflicts with recreational users.		
● Action: Promote trail etiquette through educational programs, signs, brochures, outreach with user groups, field contracts and volunteer programs.	O	3
● Action: Encourage the use of designated trail and access points. Use signs, trail maps, and educational materials to encourage appropriate visitor use.	O	3

MANAGEMENT GOALS, OBJECTIVES, AND ACTIONS	TIMING	PRIORITY
Goal: Trails		
Objective 1: Plan trails to minimize the risk of weed introduction and spread and habitat loss.		
● Action: Place any trails near grassland edges to limit the fragmentation of large blocks of habitat.	O	1
Objective 2: Preserve scenic values of the property.		
● Action: Use existing trails and roadbeds for trail design as appropriate. Using the existing disturbed areas reduces the ecological footprint on the property and preserves the scenic views.	S	2
● Action: Design parking lots, restroom, and visitor facilities to minimize the visual impact to the property.	2	2
● Action: Close trails that enter the park from adjacent residential areas and reclaim area.	S	2
Goal: Geology To keep the geological land formations in their natural state.		
Objective 1: Protect the formations from erosion due to visitor use.		**How**
● Action: Trail use is to have minimal usage next to formations, keep trails at least 10 feet from formations.	O	2
● Action: In areas where climbing is permitted, erosion rate should be checked frequently. If erosion rate is high climbing should be stopped.	O	1
Objective 2: Prevent noxious weeds from growing on formations.		**How**
● Action: Remove any noxious weeds that are growing on the formations.	O	1

MONITORING

Resource monitoring is performed to determine how well management objectives and goals are met. Monitoring becomes a key element in order to measure success and provides a feedback mechanism for decision-making that keeps the plan active and sustainable. Monitoring provides information on what changes are occurring in the Red Rock Canyon Open Space. Some resources may be adversely affected resulting in a change of management techniques. Monitoring should also influence access and recreation management. Techniques for monitoring the overall landscape include photo monitoring, vegetation and landscape mapping, and wildlife and field surveys.

The monitoring of specific resources should be performed on a periodic basis. Some monitoring actions are ongoing and occur through standard patrol activities. Others need to be scheduled several times a year, annually, or every five years. Other monitoring activities may be triggered by particular events or management actions. Table 4 is a summary of resource monitoring actions included in the Management Plan and a general resource monitoring schedule including frequency and methods.

Table 4: Summary of Resource Monitoring Actions and General Monitoring Schedule

Monitor Actions		
Monitoring Actions for Invasive and Noxious Weed Control	**Frequency**	**How**
● Action: Photos should be taken of known weed infestations and compared annually to track success of control efforts.	Annually	Photos
● Action: Recreational trails should be surveyed monthly during the months the weeds are growing to identify infestations.	Monthly	Visual Inspection
● Action: Soil compaction from trail construction and maintenance should be monitored monthly during the period of noxious weed growth.	Monthly	Visual Inspection

Wildlife Monitoring	**Frequency**	**How**
● Action: Monitor the status of wildlife habitat	Annually	Visual Inspection
● Action: Survey the Open Space for signs of Predation by domestic pets.	Annually	Visual Inspection

Monitor Actions		
Visitor Use Monitoring	**Frequency**	**How**
● Action: Monitor existing access points for problems such as social trails, capacity at trailheads, parking in neighborhoods for accessing trails, and vandalism.	Annually	Visual inspection
● Action: Monitor visitor use and evaluate recreational impacts to vegetation, wildlife and visual resources.	Annually	Visual inspection

Historic Use Monitoring	**Frequency**	**How**
● Action: There are no monitoring actions recommended for historic and cultural resources on the Red Rock Canyon Open Space. Monitoring recommendations may change based on future information.	N/A	N/A

Geology Formation Monitoring	**Frequency**	**How**
● Action: All formations should be checked for erosion and vandalism.	Annually	Photos for erosion and visual for vandalism.
● Action: In areas where climbing is permitted, they should be analyzed frequently.	Every 4 months	Photos

BIBLIOGRAPHY

Beck, K.G. "Biology and Management of the Toadflaxes." Colorado State University Cooperative Extension, Natural Resources Online Factsheets. Retrieved 4/1/04. www.ext.colostate.edu/pubs/natres/03114.html

Beck, K.G. "Canada Thistle." Colorado State University Cooperative Extension, Natural Resources Online Factsheets. Retrieved 4/1/04. www.ext.colostate.edu/pubs/natres/03108.html

Bock, John G.. "In Red Rock Canyon Land." Colorado Springs, Colorado: Privately Published, Undated. Reproduced 1999. By Colorado City Historical Society.

Christiansen, Eric H, and Hamblin, Kenneth W. *Earth's Dynamic Systems.* Upper Saddle River, Prince-Hall, Inc 2001.

Chronic, Halka and Williams, Felicie. *Roadside Geology of Colorado.* Missoula, Montana, Mountain Press Publishing Company, 2002.

CNHP. www.cnhp.colostate.edu/

Crawford, Timothy A, and Carroll, Christopher J. Geologic Map of the Colorado Springs Quadrangle, El Paso County, Colorado. Colorado Geological Survey 2000.

Ellis, Don. "A New Era." Westward Ols Colorado City Historical Society. Volume 19, Issue 3 (2004) Pg. 1-5

Ellis, Don. "The John Bock Story." The Red Rock Rag. Volume I, Number 5. (2000) Pg. 2 & 3

Halteman, Phillip; Kelso, Tass; Reis, Scott. "*Plant Communities Of The Red Rock Canyon Open Space, Colorado Springs".* Dept of Biology, Colorado College. Oct 26, 2003.

Minnesota Department of Natural Resources. "Russian Olive." Invasive/Harmful Exotic Species. Retrieved 4/1/04. www.dnr.state.mn.us/woodyplants/russianolive.html

Muzika, Rose-Marie. "Russian Olive." National Parks Service Alien Plant Invaders of Natural Areas. Retrieved 4/1/04. www.nps.gov/plants/alien/fact/elan1.htm

Putman, Terry. "*Management Plan For Austin Bluffs (University Park) Open Space".* City of Colorado Springs, Parks, Recreation and Cultural Services.

Wisconsin Department of Natural Resources. "Siberian Elm." Invasive Species, Non-Native Plants. Retrieved 4/1/04. http://dnr.wi.gov/org/land/er/invasive/factsheets/elm.htm

ACKNOWLEDGMENTS

City Council

Lionel Rivera, Mayor
Tom Gallager
Jerry Heimlicher
Darryl Glenn
Scott Hente
Randy Purvis
Margaret Radford
Richard Skorman
Larry Small

Parks and Recreation Advisory Board

Randle Case II
Stephen Harris
Getty Nuhn
Paula Peral
Daisy Chun Rhodes
Larry Royal
Thomas Russell
Frogard Ryan
Jim Schwerin

Parks, Recreation and Cultural Services Director

Paul D. Butcher

TOPS Working Committee

Kent Obee, Chair
Daphne Greenwood
Jan Gregg
Curt Heimsoth
Bill Koener
Donna Mumma
Jerry Retherford
Ron Rubin
Richard Stettler
Scot Hume, Alternate

Planning Team

Terry Putman, Manager of Planning, Design & Development & TOPS
Sarah Keith, Design & Development
Christian Lieber, TOPS Administrator
Matt Mayberry, Colorado Springs Pioneers Museum
Kurt Schroeder, Manager of Parks Maintenance, Trails & Open Space
Rick Severson, Regional Parks Supervisor
Denise Sherwood, Layout & Design
Scott Thompson-Buchanan, FIMS/Mapping

Plan Production

Printing, City of Colorado Springs, Office Services

CITY OF COLORADO SPRINGS
PARKS, RECREATION & CULTURAL SERVICES
1401 RECREATION WAY
COLORADO SPRINGS, CO 80905
www.springsgov.com